REMARKS

The May 4, 2006 Office Action was based on pending Claims 1–22, 31–47 and 49. By this Response, Applicant is amending Claims 1, 4, 12, 31, 33, 40 and is cancelling Claims 21, 32, 34–36, 41 and 49 without prejudice or disclaimer. Claims 2, 3, 5–11, 13–20, 22, 37–39, 42–47 remain as originally filed or previously presented.

Thus, after entry of the foregoing amendments, Claims 1–20, 22, 31, 33, 37–40 and 42–47 are pending and presented for further consideration. In view of the foregoing amendments and the remarks set forth below, Applicant respectfully requests allowance of Claims 1–20, 22, 31, 33, 37–40 and 42–47.

SUMMARY OF OBJECTIONS AND REJECTIONS

The May 4, 2006 Office Action objected to Claim 40 because of claim informalities.

The Office Action rejected Claim 21 under 35 U.S.C. § 112, second paragraph, as being indefinite.

Claims 1–4, 8, 11–16, 18, 20, 21, 31, 32, 36, 37, 39–41, 43, 45, 46 and 49 were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 5,948,100 to Hsu et al. ("Hsu").

Claims 5–7, and 22 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Hsu in view of U.S. Patent No. 4,860,192 to Sachs et al. ("Sachs"). Claims 9, 19, 33, 34 and 44 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Hsu.

Furthermore, the Office Action rejected Claims 10, 17, 35 and 42 under 35 U.S.C. § 103(a) as being unpatentable over Hsu in view of U.S. Patent No. 5,764,946 to Tran et al. ("Tran"). Claims 38 and 47 were also rejected under 35 U.S.C. § 103(a) as being unpatentable over Hsu in view of U.S. Patent No. 6,085,291 to Hicks et al. ("Hicks").

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Submitted concurrently herewith is a Supplemental Information Disclosure Statement citing five (5) references, which were cited during the prosecution of co-

pending related U.S. patent applications. While Applicant does not believe that these references will affect the patentability of the pending claims, Applicant respectfully requests the Examiner to consider the pending claims in connection with these references in order to make them of record.

OBJECTION TO CLAIM 40 FOR CLAIM INFORMALITIES

In response to the Office Action's objection to Claim 40, Applicant has amended "said cache memory means" to recite "said cache data memory means."

CLAIM REJECTION UNDER 35 U.S.C. § 112, SECOND PARAGRAPH

The Office Action rejected Claim 21 as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Although Applicant disagrees with this rejection, in order to expedite prosecution of the present application, Applicant has cancelled Claim 21 without prejudice or disclaimer.

CLAIM REJECTIONS UNDER 35 U.S.C. § 102(e)

Claims 1–4, 8, 11–16, 18, 20, 31, 37, 39, 40, 43, 45 and 46 were rejected as being anticipated by Hsu. In view of the foregoing amendments and for at least the reasons set forth below, Applicant respectfully requests reconsideration of the aforementioned claims.

Independent Claim 1

With particular reference to amended Claim 1, one embodiment of Applicant's invention includes a method of searching a string of data for a match with a test data string. The method includes, among other things, receiving an instruction to perform a search operation for a test data string and routing the instruction to a data string manipulation circuit capable of performing string manipulation instructions.

The method also includes comparing portions of the test data string with consecutive portions of data stored in a cache memory array and generating a match signal based on the comparison. Moreover, the method includes identifying multiple match signals that indicate the consecutive portions of the cache memory data that together match each of the portions of the test data string and routing an address of

cached data matching the test data string to the data string manipulation circuit. In certain embodiments, such a method advantageously allows for portions of a data string that is longer than one byte to be analyzed (e.g., compared) in a coupled fashion for a match with consecutive portions of cache memory data.

Hsu does not disclose the method of amended Claim 1. Rather, Hsu appears to disclose branch instruction prediction and instruction fetching in a superscalar pipelined processor. In particular, certain methods are disclosed for predicting a branch address in a sequence of instructions using a branch target buffer (see, for example, Figure 9). The disclosed methods include receiving a search address and simultaneously comparing a tag portion of the search address with tag portions of entries stored in multiple blocks of memory locations in the branch target buffer.

Hsu does not disclose, among other things, comparing portions of a test data string with consecutive portions of cache memory data and identifying multiple match signals that indicate the consecutive portions of the cache memory data that together match the test data string. Rather, the branch target buffer (200) of Hsu appears to compare tag portions of multiple blocks in a tag RAM (210) with the same piece of data (i.e., the tag portion of a Search Address) (see, e.g., Figure 9; col. 14, lines 23–65). Thus, because Hsu is concerned with matching a particular tag portion of a search address, Hsu neither discloses, nor would have a reason to incorporate, identifying a plurality of match signals indicating adjacent portions of data stored in a cache memory array that together match each of the portions of a test data string.

Because Hsu does not teach each and every element as recited and arranged in amended Claim 1, Applicant respectfully submits that Claim 1 is not anticipated by Hsu. Applicant, therefore, respectfully requests the rejection under 35 U.S.C. § 102(e) to be withdrawn.

Independent Claims 12, 31 and 40

Independent Claims 12, 31 and 40 are each believed to be patentably distinguished over Hsu for reasons similar to those set forth above with respect to amended independent Claim 1 and for the different aspects recited therein.

Dependent Claims 2–4, 8, 11, 13–16, 18, 20, 37, 39, 43, 45 and 46

Claims 2–4, 8 and 11 depend from amended independent Claim 1 and are believed to be patentably distinguished over Hsu for reasons similar to those set forth above with respect to Claim 1 and for the additional features recited therein.

Claims 13–16, 18 and 20 depend from amended independent Claim 12 and are believed to be patentably distinguished over Hsu for reasons similar to those set forth above with respect to Claim 1 and for the additional features recited therein.

Claims 37 and 39 depend from amended independent Claim 31 and are believed to be patentably distinguished over Hsu for the reasons similar to those set forth above with respect to Claim 1 and for the additional features recited therein.

Claims 43, 45 and 46 depend from amended independent Claim 40 and are believed to be patentably distinguished over Hsu for the reasons similar to those set forth above with respect to Claim 1 and for the additional features recited therein.

CLAIM REJECTIONS UNDER 35 U.S.C. § 103(a)

The Office Action rejected Claims 5–7 and 22 as being unpatentable over Hsu in view of Sachs. Claims 9, 19, 33 and 44 were rejected under as being unpatentable over Hsu. Furthermore, Claims 10, 17 and 42 were rejected as being unpatentable over Hsu in view of Tran. Claims 38 and 47 were rejected as being unpatentable over Hsu in view of Hicks.

For the reasons set forth below, Applicant respectfully disagrees with the rejections and the Office Action's characterization of each of Hsu, Sachs, Tran and Hicks.

Dependent Claims 5–7, 9, 10, 17, 19, 22, 33, 38, 42, 44 and 47

Claims 5–7, 9 and 10 depend from amended independent Claim 1 and are believed to be patentably distinguished over the cited references for the reasons set forth above with respect to Claim 1 and for the additional features recited therein. For example, neither Hsu, nor any of the aforementioned cited references, nor a combination thereof, teaches or suggests a method including: generating a match signal for each portion of cache memory data stored that matches a respective

compared portion of a test data string, identifying a plurality of match signals indicating the consecutive portions of cache memory data that together match the test data string, and routing an address of cached data matching the test data string to a data string manipulation circuit.

Claims 10, 17, 19, and 22 depend from amended independent Claim 12 and are believed to be patentably distinguished over the cited references for the reasons set forth above with respect to Claim 12 and for the additional features recited therein. For example, neither Hsu, nor any of the aforementioned cited references, nor a combination thereof, teaches or suggests a method including: generating a match signal for each portion of cache memory data that matches a respective compared portion of the test data string, identifying a plurality of match signals indicating sequential portions of the data that together match the test data string, and routing an address of cached data matching the test data string to a data string manipulation circuit.

Claims 33 and 38 depend from amended independent Claim 31 and are believed to be patentably distinguished over the cited references for the reasons set forth above with respect to Claim 31 and for the additional features recited therein. For example, neither Hsu, nor any of the aforementioned cited references, nor a combination thereof, teaches or suggests a processor including: a plurality of comparators configured to compare a byte of cache line data with a portion of a test data string and to generate a match signal when the byte of data matches the portion of the test data string, and a decoder circuit for receiving the match signals and configured to identify sequential portions of the cache line having data that, when combined, match the test data string.

Claims 42, 44 and 47 depend from amended independent Claim 40 and are believed to be patentably distinguished over the cited references for the reasons set forth above with respect to Claim 40 and for the additional features recited therein. For example, neither Hsu, nor any of the aforementioned cited references, nor a combination thereof, teaches or suggests a memory circuit including: means for searching a cache line by receiving a starting address for a search operation and aligning a data value with an offset of the starting address to search multiple portions of

the cache line in one clock cycle, and means for detecting a string of matches between the multiple portions of the at least one cache line and the compared portions of the data value.

REQUEST FOR TELEPHONE INTERVIEW

Pursuant to M.P.E.P. § 713.01, in order to expedite prosecution of this application, Applicant's undersigned attorney of record hereby formally requests a telephone interview with the Examiner as soon as the Examiner has considered the effect of the arguments presented above. Applicant's attorney can be reached at the general office number listed below.

CONCLUSION

In view of the foregoing, the present application is believed to be in condition for allowance, and such allowance is respectfully requested. If further issues remain, the Examiner is cordially invited to contact the undersigned such that any remaining issues may be promptly resolved.

Moreover, by the foregoing amendments and remarks no admission is made that any of the above-cited references are properly combinable. Rather, Applicant submits that even if the references are combined, the references still do not teach or suggest the claimed invention.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

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